



60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = +25°C
60V	18mΩ @ V _{GS} = 10V	9.2 A
	$28m\Omega @ V_{GS} = 4.5V$	7.5 A

Description and Applications

This MOSFET is designed to minimize the on-state resistance (RDS(ON)) and maintain superior switching performance, making it ideal for high efficiency power management applications.

- Load Switch
- Adaptor Switch
- Notebook PC

Features and Benefits

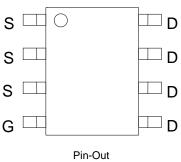
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

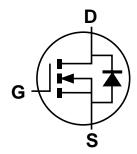
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish Matte Tin annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.076 grams (approximate)







Top View



Equivalent Circuit

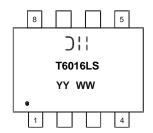
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6016LSS-13	SO-8	2500/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + CI) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



⊃¦¦ = Manufacturer's Marking T6016LS = Product Type Marking Code YYWW = Date Code Marking YY or \overline{YY} = Year (ex: 14 = 2014) WW = Week (01 - 53)



Characteristic	Symbol	Value	Units		
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) 1/ 101/	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I _D	9.2 7.4	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	Ι _D	11.9 9.5	А
Continuous Drain Current (Note 6) 1/ 4 51/	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I _D	7.5 6.0	А
Continuous Drain Current (Note 6) V _{GS} = 4.5V	t<10s	$T_A = +25$ °C $T_A = +70$ °C	Ι _D	9.7 7.7	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I_{DM}	60	Α		
Maximum Continuous Body Diode Forward Current (Note 6)			Is	2	Α
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	15.3	Α
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	11.7	mJ

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P_D	1.5	W	
Thermal Resistance, Junction to Ambient (Note 5)			85	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	45	°C/W
Total Power Dissipation (Note 6)	P_D	2.1	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	7	74	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	37	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	13	°C/W	
Operating and Storage Temperature Range	$T_{J_i}T_{STG}$	-55 to 150	°C	

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	$V_{DS} = 48V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(th)}$	1	_	2.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	_	18	mΩ	$V_{GS} = 10V, I_D = 10A$	
Static Dialif-Source Off-Resistance	R _{DS} (ON)	_	_	28	11122	VGS = 4.5V, ID = 6A	
Diode Forward Voltage (Note 7)	V_{SD}	_	0.7	1.2	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	_	864	_		.,	
Output Capacitance	Coss	_	282	_	pF	$V_{DS} = 30V$, $V_{GS} = 0V$, $f = 1MHz$	
Reverse Transfer Capacitance	C_{rss}	_	27	_		1 = 1101112	
Gate resistance	Rg	_	1.3	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	8.4	_			
Total Gate Charge (V _{GS} = 10V)	Qg	_	17	_	000/1 404		
Gate-Source Charge	Qgs	_	3.1	_	nC	$V_{DS} = 30V, I_{D} = 10A$	
Gate-Drain Charge	Q_{gd}	_	4.3	_			
Turn-On Delay Time	t _{D(on)}	_	3.4	_			
Turn-On Rise Time	t _r	_	5.2	_		$V_{GS} = 10V, V_{DS} = 30V,$	
Turn-Off Delay Time	t _{D(off)}	_	13	_	ns	$R_G = 6\Omega$, $I_D = 10A$	
Turn-Off Fall Time	t _f	_	7	_			
Reverse Recovery Time	T _{rr}	_	22	_	ns	100 11/11 1000/	
Reverse Recovery Charge	Qrr	_	11	_	$I_F = 10A$, di/dt = 100A/ μ s		

Notes:

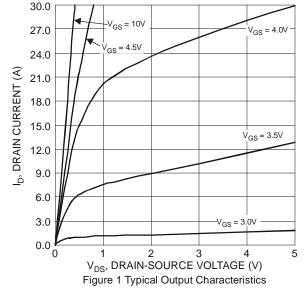
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

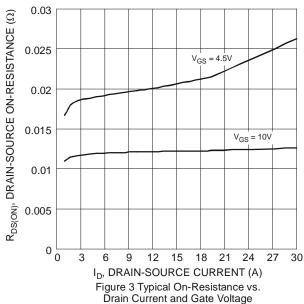
^{7.} I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep $T_J = +25$ °C.

^{8.} Short duration pulse test used to minimize self-heating effect.

^{9.} Guaranteed by design. Not subject to product testing.







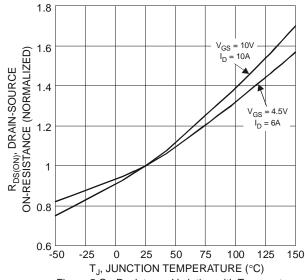
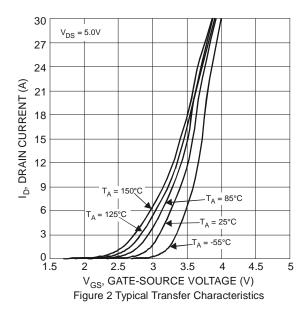
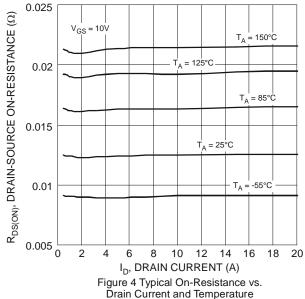


Figure 5 On-Resistance Variation with Temperature





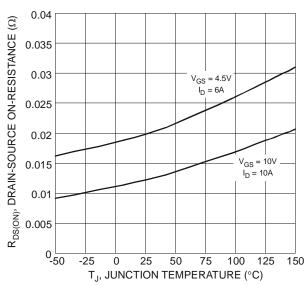


Figure 6 On-Resistance Variation with Temperature



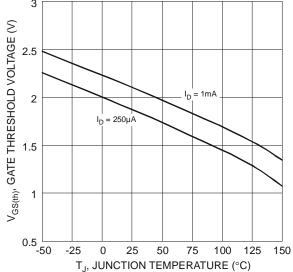


Figure 7 Gate Threshold Variation vs. Ambient Temperature

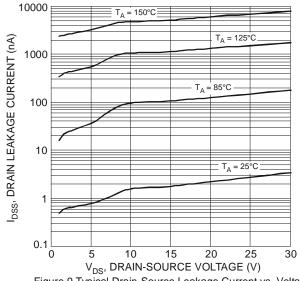
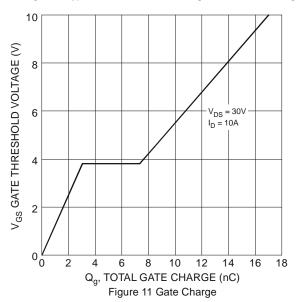
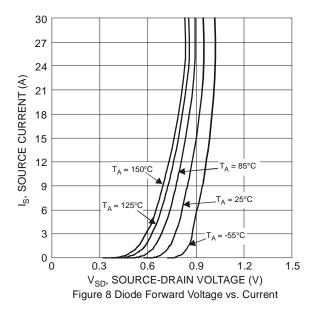
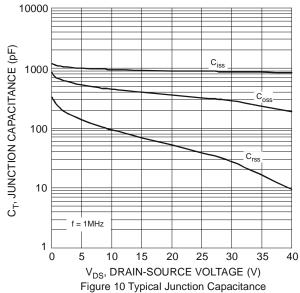
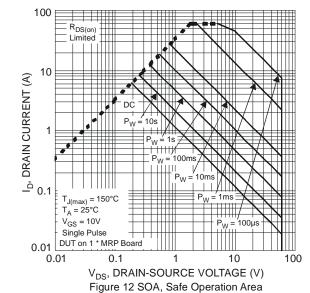


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

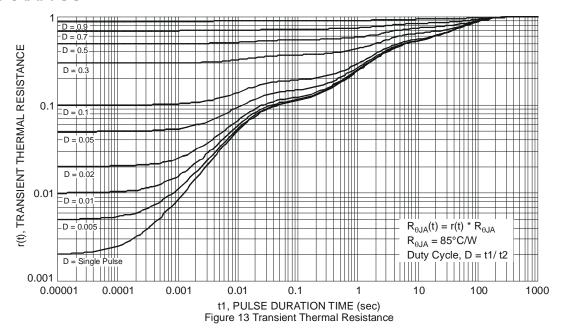






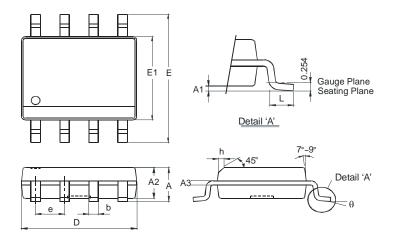






Package Outline Dimensions

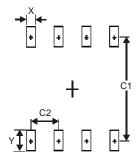
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SO-8					
Dim	Min	Max			
Α	-	1.75			
A1	0.10	0.20			
A2	1.30	1.50			
A3	0.15	0.25			
b	0.3	0.5			
D	4.85	4.95			
Е	5.90	6.10			
E1	3.85	3.95			
е	1.27 Typ				
h	-	0.35			
L	0.62	0.82			
θ	0°	8°			
All Dimensions in mm					

Suggested Pad Layout

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



Dimensions	Value (in mm)		
X	0.60		
Υ	1.55		
C1	5.4		
C2	1.27		



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Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru 4 moschip.ru 9